

absence among the refinery population: those who had frequent absences, those who had long absences, and those who had no absences. A major difference between the groups was the attitude of the men towards themselves and their work. A memory of unhappy childhood was commoner in the "frequently" and "long" sick than in a group of matched controls, while dislike of the job or frustrated ambition was common in the "frequently" sick. The "never" sick denied such personal problems with the same firmness as they denied all illness, even though one-quarter of them had organic disease on physical examination. Eysenck's personality inventory showed that the "frequently" sick had a higher extraversion and neuroticism score than the controls. The "never" sick were characterized by introversion and stability and the "long" sick by introversion and neuroticism. However, some of these conclusions need confirmation, because the control group can be validly compared only with the "frequently" sick group.

These careful studies, though on a small working group, suggest that younger men who have developed the habit of having frequent short spells of sickness absence are likely to take this experience with them into middle and older age, with an inevitable rise in overall sickness rates over the years. In addition it may be possible to identify men who are liable to have unfavourable sickness experience for a number of years at a time, if not all their working lives. If the findings are confirmed, it will be possible to concentrate attempts to alter the attitudes which lead to sickness absence which has a flimsy clinical basis where they will have most effect.

## Abdominal Decompression During Pregnancy

In 1954 Professor O. S. Heyns, of the University of Witwatersrand, found that curarization of women during labour made it less painful. But the method was potentially dangerous, so he experimented with the idea of reducing the pressure of the abdominal walls on the uterus during its contractions. This led to the development of his decompression suit, which surrounds the patient from the axillae to the feet. Beneath the suit is a rigid "spacer" overlying the lower part of the chest and abdomen. When air is mechanically sucked out of the suit the pressure on the abdominal walls is reduced by 50 to 150 mm. Hg. The abdomen swells outwards and the diaphragm descends. The effect is to alter the shape of the abdominal cavity, and the uterus, from being ellipsoidal, becomes more spherical. The uterus is therefore contracting isotonically, rather than isometrically. Heyns argues that the isotonic contraction is more efficient and so shortens labour and reduces pain.<sup>1</sup> He claims that 98% of patients decompressed during the first stage of labour are helped.

From these beginnings the work has been extended especially to the giving of oxygen together with decompression during the last weeks of pregnancy. In 1965 Heyns<sup>2</sup> recommended decompression once or twice daily from the 28th week of pregnancy. Such treatment was claimed to improve the efficiency of the placenta by increasing the flow of blood on both maternal and foetal sides, so improving the oxygen supply to the foetus and especially to its brain. The South African workers suggested that a poor oxygen supply impaired the development of the brain, leading to

lowered intelligence in the babies and even possibly to physical impairment. Conversely, they claimed that adequate oxygenation was likely to improve intelligence and give the child a "better start to life." Not surprisingly such a claim caught the attention of the popular press and of many mothers who would like their children to be of high intelligence. In lectures, a book,<sup>3</sup> and articles<sup>4,5</sup> Heyns has supported the view that the children of mothers who have undergone decompression have better mental attributes than those whose mothers have not.

The factual evidence on which this assertion is made is far from clear. D. D. Mathews and F. E. Loeffler<sup>6</sup> obtained samples of blood from the foetal scalp in early labour in a series of women who were undergoing decompression and a control series of those who were not. They found no significant differences between the groups in the acid-base oxygen saturation values in the foetal blood. They guardedly concluded that "the technique of foetal blood sampling is unlikely to prove sufficiently sensitive to detect the subtle changes in foetal oxygenation that might be produced by abdominal decompression in a healthy foetus during pregnancy or early labour." So far it would seem that Heyns's assertions about the physiological changes that flow from the use of abdominal decompression have not been experimentally proved.

R. Liddicoat<sup>7</sup> followed up the mental development of 329 babies born in Heyns's unit, the mothers having been assigned randomly to treatment and non-treatment groups, though some of the latter had had physiotherapy in place of decompression. The children were tested at the ages of 1, 4, and 9 months on the South African child development scale and at 3 years on the Merrill-Palmer scale of mental tests. The series was a very well controlled one and the results showed that there was no difference in intelligence quotients between those babies whose mothers had been decompressed and those who had received physiotherapy. On the other hand there was a difference between those who had received some treatment and those who had received none. Liddicoat showed that Heyns had unfortunately drawn the wrong conclusions about the value of decompression in improving the intelligence of children because he had left several important factors out of account. His mothers having decompression were all volunteers and probably therefore of a higher socio-economic group and I.Q. than those with whom they were compared. Moreover, Heyns had used the Gesell tests for estimating the progress of his patients, and these tests are influenced by observer bias. Furthermore, some of his conclusions were based on the mothers' own reports. The verdict must be that any claims that abdominal decompression during pregnancy improves the intelligence of children are not proved, because conclusions were drawn from a poor experimental design. Liddicoat produced a little evidence to suggest that the claims might possibly have an adverse effect, since mothers might expect too much of their children and so distort their mental development.

J. A. Blecher and Heyns<sup>8</sup> found abdominal decompression of value in the treatment of pre-eclampsia, though not of

<sup>1</sup> Heyns, O. S., *J. Obstet. Gynaec. Brit. Emp.*, 1959, **66**, 220.

<sup>2</sup> Heyns, O. S., *Discovery*, 1965, **26**, No. 6, p. 11.

<sup>3</sup> Heyns, O. S., *Abdominal Decompression*, Johannesburg, 1963.

<sup>4</sup> Heyns, O. S., Samson, J. M., and Graham, J. A. C., *Lancet*, 1962, **1**, 289.

<sup>5</sup> Heyns, O. S., *Develop. Med. Child Neurol.*, 1962, **4**, 473.

<sup>6</sup> Mathews, D. D., and Loeffler, F. E., *J. Obstet. Gynaec. Brit. Cwlth.*, 1968, **75**, 268.

<sup>7</sup> Liddicoat, R., *S. Afr. med. J.*, 1968, **42**, 203.

<sup>8</sup> Blecher, J. A., and Heyns, O. S., *Lancet*, 1967, **2**, 621.

hypertension or chronic renal disease in pregnancy. This work, together with that on the relief of pain in labour, deserves to be repeated, and the physiological changes brought about by the method require rigorous experimental examination. Such work is urgent, so that decompression can be evaluated before the trickle of mothers calling for the treatment becomes a flood, perhaps with disappointments for them and unhappy consequences for their children.

## E.E.G. Signs of Death

"Be absolute for death."<sup>1</sup> However, forensic texts suggest there is a distinction between somatic and so-called molecular death<sup>2</sup> without clearly defining either.

A pronouncement of somatic death is in fact a confident prediction, acceptable at law, that death of all the cells in the body will shortly follow. Furthermore, because ordinary clinical assessment of cerebral function is not sufficiently informative in cases of deep coma, the seemingly justifiable assumption that cerebral death has occurred is made after the apparent cessation of cardio-respiratory function for a generally agreed standard period of time, traditionally five minutes.<sup>3</sup>

Improvements in the techniques of resuscitation and in aids to survival, and more recently the need for viable human tissue for transplants, have emphasized the need for reliable data on cerebral function in the apparently moribund patient. V. A. Negovskii<sup>4</sup> has proposed a distinction between cerebral and somatic death, the former state being characterized by the abolition of all activity in the "higher" central nervous system. Likewise R. S. Schwab and colleagues<sup>5</sup> have put forward criteria for cerebral death based on the electroencephalogram.

More recently, J. M. Hockaday and colleagues<sup>6</sup> have reported particularly accurate predictions of fatal or non-fatal outcome from E.E.G. studies on patients with acute cerebral anoxia following cardiac or respiratory arrest. While clinical judgement of whether or not to withdraw artificial aids to survival may be preferred to a probability statement based on electrical data, it can none the less usefully be reinforced by such a statement; nor should it be forgotten that clinical decisions are commonly made on a very imperfect estimation of probabilities. P. F. Prior and J. Volavka<sup>7</sup> have attempted to refine the criteria of J. M. Hockaday and colleagues,<sup>6</sup> while G. Pampiglione<sup>8, 10</sup> has turned to the important question of the quality as well as the fact of survival in children resuscitated after cardio-circulatory and respiratory arrest.

Little work has been carried out in Britain to evaluate the contribution of electroencephalography to assessing the consequences of cardiac arrest. This partly reflects a national

dearth of properly trained clinical neurophysiologists.<sup>8</sup> More-over the teams concerned with intensive care could help by promoting studies, which are urgently needed, into the subject. Cardiologists in particular can help to advance such studies by recognizing that the most fruitful approach is likely to be in collaboration with their neurological colleagues. There is now a real need to promote joint studies between different disciplines and different hospitals.

The potential diagnostic value of the electroencephalographic evidence after acute cerebral anoxia derives from two main facts. Firstly, it can provide an objective index of the condition of the central nervous system at a time when ordinary physical signs are relatively uninformative. Secondly, it offers the most sensitive available measure of change in cerebral function. The technical difficulties in collecting and assessing the data are considerable and require the attention of a professional clinical neurophysiologist with experience in this particularly difficult field. It is surprising that none seems to have been concerned in the discussions promoted by the Minister of Health on the transplantation of organs.<sup>11</sup> The proper use of electroencephalographic investigations could at least prevent any premature conclusion that cerebral function had ceased.

## Defining the Ideal Ambulance

The design of ambulances has been much criticized lately,<sup>1</sup> and Dr. P. W. Bothwell returns to the attack in our correspondence columns this week (p. 366). It was therefore a timely occasion when a large and attentive audience of automobile engineers recently heard a paper on ambulance design<sup>2</sup> admirably presented by Mr. P. S. London, of the Birmingham Accident Hospital. Unfortunately the time available for the discussion was inadequate, but some valuable points were made. No speaker challenged Mr. London's contention that, so far as the conveyance of serious cases was concerned, vehicles at present available are "designed without the least regard for the effects of illness and injury," especially in respect of the suspension system. Loading and unloading difficulties were also stressed.

The motor industry is organized for the economic production of vehicles in large numbers, so that the expenses of research, development, and tooling are carried by manufacture of models in many thousands. As the small companies disappear, it becomes increasingly difficult to meet the special requirements of an ambulance designed for emergency service which, however important to the community, will never be needed in large numbers. It is for these reasons that ambulances are usually converted commercial vehicles and inherit many of the limitations of the parent design.

Mr. London made a brave attempt to define the principal requirements, and he recommended that a standing committee on ambulance design should be set up after the formation of the Central Ambulance Services Council projected in a recent report.<sup>3</sup> This body could hammer out a specification acceptable to the 136 authorities which at present buy ambulances and equipment in the United Kingdom. On such a basis an engineering programme could be initiated which would

<sup>1</sup> Shakespeare, W., *Measure for Measure*, Act 3, Scene I, line 5.  
<sup>2</sup> Glaister, J., and Rentoul, E., *Medical Jurisprudence and Toxicology*. 12th ed. Edinburgh. 1966.  
<sup>3</sup> Simpson, C. K., *Forensic Medicine*. 5th ed. London. 1964.  
<sup>4</sup> Negovskii, V. A., *Resuscitation and Artificial Hypothermia*. 1960. Moscow. Translated and published New York 1962.  
<sup>5</sup> Schwab, R. S., Potts, F., and Bonazzi, A., *Electroenceph. clin. Neurophysiol.*, 1963, 15, 147.  
<sup>6</sup> Hockaday, J. M., Potts, F., Epstein, E., Bonazzi, A., and Schwab, R. S., *Electroenceph. clin. Neurophysiol.*, 1965, 18, 575.  
<sup>7</sup> Prior, P. F., and Volavka, J., *Electroenceph. clin. Neurophysiol.* In press.  
<sup>8</sup> Royal College of Physicians of London. *Report of Committee on Electroencephalography*. 1962 and 1966. London.  
<sup>9</sup> Pampiglione, G., *Acta neurochir. (Wien)*, 1964, 12, 282.  
<sup>10</sup> Pampiglione, G., in *Neurological and Electroencephalographic Correlative Studies in Infancy*, ed. by Kellaway, P., and Petersen, I. New York. 1964.  
<sup>11</sup> *Brit. med. J.*, 1968, 1, 833.

<sup>1</sup> *Brit. med. J.*, 1967, 4, 373.

<sup>2</sup> London, P. S., The Design of Ambulances, paper read at Institution of Mechanical Engineers (Automobile Division) on 9 April 1968.

<sup>3</sup> Ministry of Health Report of the Working Party on Ambulance Training and Equipment: Part 2, Equipment and Vehicles 1965-67, 1967. H.M.S.O. London.